



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**

REGION 4  
ATLANTA FEDERAL CENTER  
61 FORSYTH STREET  
ATLANTA, GEORGIA 30303-8960

**DEC 14 2010**

Colonel Keith A. Landry, District Engineer  
Louisville District Corps of Engineers  
Attn: Lee Anne Devine (Regulatory Branch)  
OP-FN, Room 752  
P.O. Box 59  
Louisville, Kentucky 40201-0059

Subject: Leeco, Inc., Stacy Branch Mine  
U.S. Army Corps of Engineers LRL-2007-0217  
Kentucky Division of Mine Permits (KDMP) #897-0480

Dear Colonel Landry:

The U.S. Environmental Protection Agency (EPA), Region 4, has completed its review of Leeco, Inc.'s proposed Stacy Branch surface coal mining project (LRL-2007-0217) in Perry and Knott Counties, Kentucky. Our review included the most recent version of the U.S. Army Corps of Engineers (Corps) Clean Water Act (CWA) Section 404 permit application (on a CD dated March 4, 2010, which includes information originally submitted to KDMP as Surface Mining Control and Reclamation Act (SMCRA) permit application #897-0480); information submitted to KDMP with subsequent SMCRA permit amendments; supplemental mitigation documents obtained electronically on April 8, 2010, and further mitigation documents provided to staff in meetings on November 2, 2010 and November 5, 2010; supplemental information dated April 27, 2010 (including a Fill Placement Optimization Process engineering analysis); additional application amendments received by email on August 24, 2010; and two sets of supplemental information received by email on November 4, 2010, and on November 24, 2010.

This review was conducted in accordance with the Enhanced Coordination Procedures (ECP) for surface coal mining applications as detailed in the June 11, 2009 *Memorandum of Understanding among the U.S. Department of Army, U.S. Department of Interior and the U.S. Environmental Protection Agency Implementing the Interagency Action Plan on Appalachian Surface Coal Mining*. The purpose of this letter is to present EPA's project-specific comments and recommendations, including recommended special permit conditions that EPA believes are necessary to ensure compliance with the requirements of our regulations pursuant to the CWA Section 404(b)(1) Guidelines ("Guidelines"; 40 C.F.R. Part 230). The 60-day period for ECP coordination was initiated by your staff on September 16, 2010, and has been extended by mutual agreement to conclude on December 14, 2010.

As described below, EPA has significant environmental and water quality concerns with this project as currently proposed. Given the project's significant proposed impacts, including six valley fills resulting in more than four miles of permanent stream impacts, anticipated

downstream water quality effects, and associated impacts to aquatic wildlife, we believe that significant changes are needed before the project will comply with the Section 404(b)(1) Guidelines and be appropriate for permit issuance. EPA's recommended changes include:

- Requiring additional analyses to justify that avoidance of one or more valley fills proposed by the applicant is not possible, given analyses to suggest that their volume is not needed for placement of excess spoil;
- Requiring additional robust BMPs as part of construction and operation of the mine to reduce anticipated water quality impacts;
- Phasing construction of valley fills to monitor effectiveness of BMPs and to assure that initial fills represent a significant reduction in the proportion of total anticipated stream impacts from the project;
- Requiring that authorization of subsequent phases of the mining operation be contingent upon demonstrating that discharges from the operation do not cause or contribute to elevated conductivity levels associated with violations of water quality standards or cause significant degradation to streamlife;
- Conducting downstream water quality and biological monitoring to effectively assess mining impacts to downstream water quality and wildlife;
- Modifying the mitigation plan if necessary to ensure that the lost structure and function of impacted resources are being fully compensated; and
- Adequately assessing and addressing cumulative impacts of the proposed project, including environmental justice considerations.

EPA believes these improvements to the CWA Section 404 permit are necessary to ensure the project meets the requirements of the CWA and the agencies' implementing regulations, including the Section 404(b)(1) Guidelines.

---

## **Project Overview**

The CWA Section 404(b)(1) Guidelines promulgated by EPA in conjunction with the Secretary of the Army establish the substantive environmental standards for proposed discharges of dredged or fill material in waters of the United States. The Guidelines establish a sequence of review requiring: (1) an evaluation of all practicable alternatives that meet the project's basic purpose to ensure that only the Least Environmentally Damaging Practicable Alternative is permitted; (2) taking all appropriate and practicable steps to minimize potential adverse impacts; and (3) compensating for all remaining unavoidable impacts to aquatic resources. In addition, the Guidelines require that no discharge may be permitted that would cause or contribute to significant degradation of waters of the United States. The Guidelines form the basis of our review of this permit application, and we have highlighted particularly relevant provisions below.

Leeco, Inc.'s proposed Stacy Branch project was placed on the final list of applications subject to the ECP on September 30, 2009, due to environmental concerns regarding avoidance and minimization, compensatory mitigation, cumulative impacts, and the potential for downstream water quality impacts. The proposed project is a new surface coal mine that would conduct contour, auger, and area mining operations over 869 acres. The project area straddles the eastern Perry County-southwestern Knott County boundary in Kentucky. It was originally

permitted by KDMP under Permit #897-0480 on June 6, 2007, a permit that has been subsequently amended several times. Leeco has requested authorization to construct six valley fills and six temporary sediment control ponds that would permanently impact 22,861 linear feet (lf) of streams, or 4.3 miles (5,914 lf of intermittent and 14,807 lf of ephemeral streams). These streams are tributaries to Stacy Branch, Yellow Creek and Sugar Creek. Sediment ponds proposed beneath the six valley fills would impact an additional 2,140 lf of intermittent stream reaches.

### **Alternatives Analysis – 40 CFR § 230.10(a)**

The Section 404(b)(1) Guidelines, (Guidelines) 40 CFR § 230.10(a), provide that no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge that would have less adverse impact on the aquatic ecosystem. The Guidelines require consideration of project alternatives to eliminate and/or reduce the number of discharges of dredged or fill material occurring in the waters of the United States. Only the Least Environmentally Damaging Practicable Alternative (LEDPA) may be permitted. To identify the LEDPA, a full range of practicable alternatives that would avoid and minimize impacts to aquatic resources must be evaluated. When evaluating permit applications in light of this provision, key factual considerations should include the adequacy of the alternatives analysis submitted, the number and size of valley fills, the number and extent of streams to be impacted, the nature of downstream water quality impacts (including impacts to aquatic wildlife), and the number and location of sediment ponds.

To supplement the original alternatives analysis included in the CWA Section 404 permit application, the applicant has submitted a Fill Placement Optimization Process (FPOP) analysis following Kentucky Reclamation Advisory Memorandum (RAM) 145. This analysis calculates the maximum stream impact allowable under present Commonwealth guidelines by optimizing placement of excess spoil material. As described in the applicant's analysis, the Stacy Branch project has minimized its impacts to waters of the United States consistent with FPOP and operational constraints. The applicant twice submitted additional information on practicability of alternatives, which was received by EPA on November 4, 2010, and November 23, 2010.

EPA appreciates the FPOP avoidance and minimization analysis submitted by the applicant and the company's efforts to avoid and minimize impacts using this process. However, EPA has concerns that the applicant has not appropriately evaluated opportunities to avoid constructing one or more of the six valley fills it has proposed. For example, the applicant justifies the need for valley fill #7 based in part on the proposed mining sequence and on an assumption that haul distances greater than ½-mile are infeasible. Another example is valley fill #5, which as proposed would contain less than 2 percent of the overall spoil volume proposed for placement in valley fills (205,951 yd<sup>3</sup> of 11,055,218 yd<sup>3</sup>).

EPA believes that the applicant's additional analysis of avoiding one or more fills is not sufficient to determine practicability, and the applicant should further evaluate avoidance of one or more valley fills. EPA does not believe that constraining haul distances to ½ mile is a sufficient justification for demonstrating that a specific valley fill is operationally necessary. Also, avoiding valley fill #5 would preserve the highest quality stream on the project site, as

measured by its low levels of specific conductance. This would help ensure that this stream continues to contribute dilution water to the watershed.

In addition to up-front avoidance of at least one additional valley fill, we recommend that the Corps work with the company and the State after initial phases of mining are completed to compare coal tonnage actually being mined, spoil generation rates, and the amount of spoil stored in valley fills with permitted levels to assess whether approved spoil volumes are being generated and to reevaluate excess spoil storage requirements. EPA also believes that fill compaction proposed by the applicant as a Best Management Practice (BMP) may further reduce the need to place spoil in one or more valley fills on the project site. If the permittee is successful in optimizing fill placement such that one or more valley fills is not necessary, or if the Corps determines that the permittee's analysis is insufficient or not compelling, EPA believes that the permit should require that any unfilled valley(s) be protected by a permanent conservation easement to ensure that the preserved stream continues to provide dilution water to the watershed.

**“Compliance with Other Environmental Standards” – 40 CFR § 230.10(b) and “Significant Degradation” – 40 CFR § 230.10(c)**

The Section 404(b)(1) Guidelines, 40 CFR § 230.10(b), provide that no discharge may be permitted that would cause or contribute to a violation of any applicable water quality standard, violate any applicable toxic effluent standard, or jeopardize the existence of threatened or endangered species. When evaluating permit applications in light of this provision, key factual considerations should include the pre-mining water quality and potential for water quality impacts downstream of proposed sediment ponds, including impacts from selenium, conductivity, pH, turbidity, dissolved solids, and manganese; the potential impacts to biotic integrity as a result of water quality degradation; and impacts to threatened and endangered aquatic species.

A growing body of scientific evidence demonstrates that certain pollutants or pollutant parameters associated with coal mine discharges are causing or contributing to violations of narrative water quality standards.<sup>1</sup> Recent studies have shown that there is a direct correlation between stream impairment and discharge of total dissolved solids (TDS)/specific conductance (SC, or conductivity) due to Appalachian surface coal mining. As described in the *Cumulative Impact Assessment—North Fork Kentucky River Watershed* submitted with the applicant's Section 404 permit application, the native biotic communities in Stacy Branch have previously

---

<sup>1</sup> On April 1, 2010, EPA released two Office of Research and Development (ORD) reports: *The Effects of Mountaintop Mines and Valley Fills on Aquatic Ecosystems of the Central Appalachian Coalfields* and *A Field-Based Aquatic Life Benchmark for Conductivity in Central Appalachian Streams*. The ORD reports have been submitted to the EPA Science Advisory Board (SAB) for review and are also publicly available. In the interim, EPA views the reports as providing information, along with published, peer-reviewed scientific literature, that may inform permit reviews.

Based on the best information available to EPA, projects with predicted specific conductance (conductivity) values below 300 µS/cm generally are not likely to cause water quality violations or significant degradation of the aquatic ecosystem, at least not based on conductivity alone. Discharges with levels of conductivity above 500 µS/cm generally are likely to be associated with adverse impacts that could cause or contribute to significant degradation and/or excursions from narrative water quality criteria.

been degraded by mining, with Macroinvertebrate Biotic Index (MBI) scores at four Stacy Branch stations measured as poor or very poor.

EPA believes the Kentucky Pollutant Discharge Elimination System (KPDES) General Permit (KYG046177; effective July 23, 2007) issued for this project does not adequately protect water quality, including long-term and cumulative effects on downstream water quality. Prior to issuing the KPDES general permit, the Commonwealth did not conduct any Reasonable Potential (RP) analysis or calculate any numeric effluent limitations for total dissolved solids or other mining-associated pollutants to ensure compliance with water quality standards. EPA believes that additional water quality-related permit conditions should be required as part of the Section 404 permit to ensure that water quality criteria and designated uses are protected.

The Section 404(b)(1) Guidelines, 40 CFR § 230.10(c), provide that no discharge shall be permitted that will cause or contribute to significant degradation of the waters of the United States. When evaluating permit applications in light of this provision, key factual assessments should include all direct, indirect, and cumulative adverse effects of the proposed mine in consideration of current, previous and reasonably foreseeable future impacts; a watershed assessment of total length of streams to be impacted and/or total area of valley fills in waters of the United States; the extent of streams to be impacted, including extent of impacts to critical headwater streams and/or perennial reaches; the geographic location of the proposed mine; and an assessment of impacts based on a watershed-scale evaluation of stream quality, water temperature, stream diversity, and other relevant factors.

To protect water quality and prevent significant degradation of waters of the United States, EPA recommends that the following principles be incorporated within the Section 404 permit issued for the Stacy Branch project. While the applicant has taken steps to incorporate several of the practices described below within the mining plan, EPA believes that additional actions are necessary to protect receiving waters from further elevation of pollutants or pollutant parameters and to prevent significant degradation of downstream waters. These actions include more robust best management practices, sequencing of valley fill construction, adaptive management actions that may be necessary based on water quality and biological monitoring, and monitoring and remediation of cumulative watershed impacts. Detailed proposed Special Conditions for implementing these recommendations are included in Enclosure 1 (Recommended Special Permit and Monitoring Conditions), and Enclosure 2 (Adaptive Management Plan Timelines).

#### Use of Best Management Practices

Based on the scientific information described above, EPA is concerned that the project is likely to cause or contribute to violations of applicable water quality standards and result in significant degradation of the aquatic environment. EPA's key concerns relate to the project's likelihood of further elevating total dissolved solids in streams already impacted by previous mining practices. To help address these concerns, the applicant has identified specific construction practices and mining operation improvements (or Best Management Practices (BMPs)), associated with the placement of fill material into waters of the United States, that are intended to reduce the likelihood of further elevating mining-related pollution in downstream receiving waters. These BMPs are laid out in Enclosure 1 (Recommended Special Permit and

Monitoring Conditions). EPA appreciates the applicant's willingness to implement these BMPs and believes these BMPs are necessary operational improvements to the mine and should be included as requirements in the Corps permit.

Due to the significant scale of the proposed project and uncertainty regarding BMP effectiveness, EPA believes that additional BMPs should be implemented immediately in order to reduce the likelihood that water quality problems will occur. Such BMPs could include taking further steps to minimize water infiltration into fill material using synthetic caps or liners, promoting diffuse discharges to mimic forested watersheds using techniques such as weep berm-forest passive treatment systems, and utilizing the Forest Reclamation Approach (FRA). EPA recommends that these BMPs be implemented immediately. EPA would strongly support efforts by the applicant to obtain authorization as needed from the Office of Surface Mining Reclamation and Enforcement to use these techniques as SMCRA Experimental Practices.

#### Sequencing of Valley Fill Construction

As referenced above, a substantial body of scientific information, including research conducted by EPA, has demonstrated significant downstream water quality impacts from Appalachian surface coal mining operations, particularly as a result of discharges of total dissolved solids and selenium from valley fills. In EPA's review of proposed projects, a key goal is to ensure that surface coal mining operations do not continue to cause similar long-term deleterious effects, which are difficult to remediate after mining-related discharges of fill have begun. Toward this goal, EPA believes that large-scale mining projects should be "sequenced," an approach involving phased approval of valley fills consistent with results of ongoing monitoring to assess the nature and extent of environmental impacts and the effectiveness of BMPs in reducing these impacts. Under this approach, additional valley fills may only be approved where monitoring demonstrates that previously authorized discharges are fully consistent with applicable requirements of the law.

For this proposed project, EPA appreciates that the applicant has submitted analyses describing the potential for phasing of the proposed project (analyses received November 4, 2010, and November 23, 2010). The applicant proposes to initially construct fills 4, 3, and 2 which would impact 75 percent of the total length of streams proposed to be impacted by the mine, and to construct the remaining three fills (5, 6, and 7) "as encountered." The applicant further proposes that no more than three fills will be in construction at any time. During construction, the applicant proposes to monitor the effluent of the ponds below each fill for conductivity, and to develop and undertake an AMP if water quality problems occur.

While EPA appreciates the applicant's phasing analysis, EPA remains concerned that the applicant's proposal would result in immediate authorization of discharges to 75 percent of the total linear footage of waters of the U.S. proposed to be impacted on the project site. These impacts are likely to be irreversible. EPA believes the initial approval of valley fills should represent a significantly lower percentage of total anticipated impacts, and that no additional discharges be approved until an assessment of the water quality and biological effects is completed. EPA recommends that no more than two valley fills should be under construction at one time, including no more than one of the three largest fills (3, 4 and 6). While other surface coal mining projects have successfully demonstrated the ability to fully sequence fill

construction (one at a time), in this case EPA believes that the applicant's willingness to implement BMPs that prescribe sequential lift fill construction with minimal ground disturbance outside the lift under construction makes more than one concurrent fill (but no more than two fills) operationally necessary. Given the nature and extent of anticipated water quality and environmental impacts associated with the mine and the operational and engineering considerations identified by the applicant, we believe this approach is appropriate and consistent with the requirements of the law.

### Adaptive Management

Due to significant uncertainty regarding the water quality effects of the BMPs described above, EPA believes that adaptive management is critical to addressing and thereby preventing irreversible downstream water quality impacts. Baseline conductivity levels in streams to be affected by the proposed project exceed levels associated with healthy aquatic communities in central Appalachian streams. To address the potential for the project to cause significant degradation or exacerbate existing downstream water quality impacts, the applicant has proposed an Adaptive Management Plan (AMP) that identifies specific actions to be undertaken to ameliorate such effects. The applicant has proposed that conductivity of 500  $\mu\text{S}/\text{cm}$  or background conductivity,<sup>2</sup> whichever is greater, in streams below valley fills, be included in the Special Permit Condition for triggering remedial action (referred to in the applicant's supplemental response as "the conductivity threshold"). Monitoring in streams showing conductivity levels that approach or exceed the conductivity threshold following initial fill construction would require the applicant to implement additional BMPs to address water quality concerns. The applicant has proposed an approach with up to two phases of AMP actions to be undertaken if water quality monitoring continues to exceed the conductivity threshold.

While EPA recognizes that the applicant's proposed AMP is a significant step forward, EPA believes that the Corps permit should not authorize further discharges until conductivity levels in streams below mining remain consistently below levels that current research demonstrates are inconsistent with applicable narrative water quality standards and significant degradation of the aquatic environment. EPA believes that Special Permit Conditions should require AMPs to ensure that effluent conductivity levels do not exceed 500  $\mu\text{S}/\text{cm}$ , and in-stream conductivity levels do not exceed 500  $\mu\text{S}/\text{cm}$  or increase above current background levels if levels are already above 500  $\mu\text{S}/\text{cm}$ . Therefore, EPA believes that monthly average flow-weighted effluent conductivity trends or two consecutive measurements that exceed 500  $\mu\text{S}/\text{cm}$  in any pond's effluent (as defined in Recommended Special Permit Condition I.E.), should trigger a requirement for an effluent AMP. Similarly, monthly average in-stream conductivity trends or two consecutive measurements that exceed 500  $\mu\text{S}/\text{cm}$  or background in any stream (as defined in Recommended Special Permit Condition I.F.), should trigger a requirement for a stream AMP. If, after two rounds of adaptive management under either the effluent or the stream AMP, monthly flow-weighted average effluent conductivities remain above 500  $\mu\text{S}/\text{cm}$ , or in-

---

<sup>2</sup> Background conductivity for the streams associated with each hollow fill is proposed to be equal to the maximum value among that data available for each stream, as summarized in Table 1 in the document "Stacy Brach [sic] Supplemental Response - EPA Comment Letter I (1).pdf" received November 23, 2010. As summarized by the applicant, three streams are currently below 500  $\mu\text{S}/\text{cm}$  (those associated with fills 5, 6, and 7), while three streams are above 500  $\mu\text{S}/\text{cm}$  (those associated with fills 2, 3, and 4). EPA disagrees with using the maximum of each stream's available data to define the background condition.

stream conductivities remain above 500  $\mu\text{S}/\text{cm}$  or background, then the permittee should immediately cease discharges of fill material into waters of the U.S., unless required for reclamation of any open fills, until both effluent and in-stream conductivity falls below 500  $\mu\text{S}/\text{cm}$  (as defined in Recommended Special Permit Conditions I.E. and I.F.). If either of these scenarios occurs, the applicant could implement additional BMPs or could undertake actions that reduce, treat, or eliminate discharges of water from fills or reclaimed lands into the affected receiving waters. If these actions reduced effluent and in-stream conductivity levels below 500  $\mu\text{S}/\text{cm}$ , mining activities could continue and additional fills could be authorized. Actions that we propose for consideration within these AMPs are outlined in Enclosure 1 (Recommended Special Permit and Monitoring Conditions).

### Cumulative Water Quality Effects

The applicant's *Cumulative Impact Assessment—North Fork Kentucky River Watershed* identified existing water quality and biological impacts to streams in the watershed. Many of these impacts are likely a result of past and/or ongoing surface coal mining activities. EPA is concerned that the proposed project may further exacerbate these impacts by reducing the existing contribution of clean water from streams on the project site to downstream waters. Such dilution may be reduced at a watershed level even if individual streams on the project site remain below 500  $\mu\text{S}/\text{cm}$ .

To address this concern, EPA believes that the AMP should also require monitoring of conductivity levels downstream of the proposed operation in Stacy Branch, Sugar Creek, and Yellow Creek, commencing upon authorization of activities at the project site. Several months of monitoring data should be collected to establish a baseline conductivity level against which future project impacts will be evaluated. If the baseline conductivity level is below 500  $\mu\text{S}/\text{cm}$  before the mining project begins, action under the AMP should be triggered if monitoring shows that conductivity exceeds 500  $\mu\text{S}/\text{cm}$  as a result of the project. If the baseline conductivity level exceeds 500  $\mu\text{S}/\text{cm}$  before the mining project begins, then action under the AMP should be triggered if monitoring shows a net increase in conductivity levels from this baseline as a result of this project.

### Compensation for Unavoidable Impacts – 40 CFR § 230.91

EPA is concerned that the proposed compensatory mitigation plan for this project is inadequate in its current form. To ensure that this project complies with the Section 404(b)(1) Guidelines, EPA recommends that the Corps address the following issues:

- Discrepancies between stream assessments conducted by EPA and those conducted by the applicant, including missing documentation from the applicant to justify its conclusions that streams to be impacted are of low quality;
- Concerns over the temporary nature of sediment pond impacts (which your staff have acknowledged are not temporary); and
- Concerns over use of Tates Pond and Spring Branch mitigation projects due to potential downstream water quality concerns and use of Nationwide Permit 27 as a de facto mitigation bank.



### Discrepancies Among Stream Assessments

Mitigation requirements calculated for this project are based on the applicant's stream assessments performed using the Eastern Kentucky Stream Assessment Protocol (EKSAP). EPA has concerns regarding the EKSAP Ecological Integrity Index (EII) scores, and in particular the Rapid Bioassessment Protocol (RBP) component, as calculated by the applicant. In particular, EPA is concerned that these scores may underestimate stream quality and therefore lead to inadequate compensatory mitigation.

To help inform EPA's evaluation of the Stacy Branch project, EPA Region IV conducted site visits to spot-check the applicant's assessments, and assessed stream conditions at one location below each proposed valley fill. Although EPA did not assess stream reaches in precisely the same locations as the applicant, the Agency did assess segments comparable to the pond segments assessed by the applicant's EII determination. EPA's spot checks were in the applicant's assessed stream segments. In the course of its evaluation of the applicant's data, EPA learned that complete documentation of the applicant's assessments is unavailable, including the raw data on stream segments of differing condition that were averaged to determine the overall condition of each affected stream reach.

A comparison between EPA's and the applicant's data suggests that the applicant's stream assessments could be inaccurately low and therefore the proposed compensatory mitigation may be inadequate. Because the EKSAP assigns compensatory mitigation requirements partly in proportion to RBP habitat scores, these disparities in assessment scores result in similar differences in calculated compensatory mitigation requirements. EPA recommends that the applicant reevaluate the streams on site and provide complete documentation to the agencies to support the EII calculations. If these revised calculations do not demonstrate that the current compensatory mitigation proposal will adequately compensate for lost stream functions, additional mitigation should be required to offset these impacts and prevent significant degradation.

### Compensation for Non-Temporary Sediment Pond Impacts

In discussions with your staff and the applicant, we have noted that some impacts associated with sediment ponds that were originally described by the applicant as "temporary" (totaling 2,140 lf of intermittent stream) would not be temporary, but instead would last 10 years or more. EPA considers such duration to be beyond any reasonable interpretation of the term "temporary," and believes that these impacts should be mitigated contemporaneously with the impacts themselves. Your staff has verbally agreed that these impacts require additional contemporaneous mitigation.

In response to concerns expressed by EPA and your staff, the permittee has proposed to provide the additional compensatory mitigation in the form of additional credits from the Spring Branch watershed project described below. We appreciate your staff's efforts to require additional compensatory mitigation to compensate for these non-temporary impacts, but we have concerns with use of the Spring Branch watershed project as described below.

### Inappropriate Use of Nationwide Permit 27 Authorization

As part of the applicant's compensatory mitigation plan, the applicant proposes to make in-lieu fee payments to the Kentucky Department of Fish and Wildlife Resources Wetland and Stream Mitigation Program for ephemeral stream impacts. For intermittent streams, the applicant proposes to mitigate for impacts by removing an existing sediment pond (Tates Pond in Pidgeonroost Hollow, Perry County, KY), and using compensatory mitigation credits from Nationwide Permit (NWP) 27 authorization LRL-2008-738 (associated with the Spring Branch watershed in Wolfe County, KY). EPA staff has visited the proposed Tates Pond and Spring Branch compensatory mitigation sites, and believe they will provide the appropriate kind of compensatory mitigation for the loss of ephemeral and intermittent stream functions associated with the proposed mining project. However, EPA has concerns with each of these projects as a source of compensatory mitigation credits.

Tates Pond is adjacent to an apparent side-hill fill that may be the result of pre-law mining activity. The pond effluent pH at the time of EPA's visit was low (4.2). Given this low pH, EPA is concerned that this compensatory mitigation project may result in transport of acidic water downstream, which may degrade downstream waters and offset any benefits from removing Tates Pond. EPA recommends that the Corps require the applicant to modify this site's design to address the low pH, and to develop compensatory mitigation performance criteria that will ensure that the proposed compensatory mitigation does not cause or contribute to downstream water quality problems.

With respect to the Spring Branch project, EPA understands that the Spring Branch watershed project is not an approved mitigation bank. EPA further understands that the NWP 27 was applied for prior to the issuance of the April 10, 2008, Compensatory Mitigation for Losses of Aquatic Resources Final Rule (40 CFR Part 230 Subpart J and 33 CFR Part 332) and recognizes that this project is intended to provide compensation for multiple CWA Section 404 permits, including the Stacy Branch project. Given this, EPA believes that the Spring Branch project is effectively operating as a private (single user) compensatory mitigation bank. This practice is not in keeping with the goals of the 2008 compensatory mitigation rule or compensatory mitigation guidance, and does not adequately ensure that the work done under the NWP 27 will not be counted as compensatory mitigation for multiple impacts. EPA recommends that the work done in the Spring Branch watershed be considered as compensatory mitigation for the Stacy Branch project alone. Alternatively, EPA recommends that the applicant apply to the appropriate Interagency Review Team (IRT) for approval to operate as a compensatory mitigation bank which could then sell or transfer credits consistent with Clean Water Act regulations.

#### **Determination of Cumulative Effects on the Aquatic Ecosystem – 40 CFR § 230.11(g)**

The Section 404(b)(1) Guidelines, 40 CFR § 230.11(g), provide that cumulative effects attributable to the proposed project should be predicted to the extent reasonable and practicable, including the collective effects of any foreseeable future discharges in the same watershed, whether by the applicant alone or in combination with others. The Corps is required to collect and solicit information about cumulative effects on aquatic ecosystems, and to consider this information in evaluating the proposed permit. As noted earlier, the applicant has provided the *Cumulative Impact Assessment—North Fork Kentucky River Watershed*, which includes an

assessment of the Stacy Branch watershed. It is our understanding that the Corps will rely on these assessments for this permit decision.

While we appreciate the applicant's efforts, we are concerned that the assessment for the North Fork Kentucky River watershed, based on an eight-digit hydrologic unit code (HUC8), may be at a scale too large to provide a meaningful analysis of impacts from mining. We believe it is more appropriate to use a smaller geographic scope, as was done for the Stacy Branch watershed (HUC12), for making permit decisions. EPA's preliminary analysis indicates that as much as 23 percent of the Montgomery Creek-Carr Fork watershed (HUC12) has already been mined, indicating the cumulative impacts to this watershed from mining may already be resulting in water quality inconsistent with Kentucky standards. In addition, we have significant concerns over the quality of the analyses for both of the applicant's assessments, and are not confident that many of the conclusions are well supported. Moreover, we are concerned that the analyses do not address potential human health impacts, including potential impacts to private drinking water wells and other drinking water supplies. We also believe the analyses should consider, at a minimum, the ecosystem function and habitat, and the effects of the hydrologic modifications to the sub-basin and subwatersheds, as well as address the impact of deforestation and development on water quality, water quantity and other ecological conditions. We also believe the cumulative impact assessment should expand upon its baseline assessment to account for reasonably foreseeable impacts upon the resource caused by the proposed action and other anticipated actions occurring within the immediately impacted watershed and the downstream receiving watershed. We would appreciate the opportunity to discuss these issues with you in more detail, both for this particular permit application and as a more general approach to evaluating cumulative impacts for future permit applications.

#### Environmental Justice

Consistent with Executive Order 12898 ("Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations") and the accompanying Presidential Memorandum, EPA recommends that the Corps analyze the potential for disproportionately high adverse human health or environmental effects on low-income populations in the area. EPA appreciates that the applicant has submitted supplemental information including an Environmental Justice (EJ) analysis to the Corps (received by EPA on November 24, 2010). This analysis includes a characterization of the economic status of residents in Vicco, as well as Perry and Knott counties, and clearly identifies EJ communities near the proposed mine. However, EPA believes that the analysis does not adequately address several EJ concerns.

EPA recommends better quantification of effects on EJ communities, including impacts from blasting, truck traffic, noise, fugitive dust, and habitat loss. For example, the applicant's analysis does not clearly describe how potential structural damage to nearby residences from blasting would be avoided. We also recommend that an assessment of how property values may be impacted by mining activity is important to better understand the socio-economic effects of the proposed project, recognizing that economic well-being is one of the most important social determinants of health. Additional consideration should be given to the potential impacts of these activities on subsistence fishing, hunting, foraging, and gardening in the areas within and/or adjacent to the proposed permit boundary in order to protect these cultural and economic

values. Additional information is also needed concerning sources of drinking water for affected populations (including municipal water supplies and private sources of drinking water including streams and/or wells).

EPA also recommends that the Corps take steps to ensure meaningful engagement of affected communities in the permitting and NEPA process for this project. For example, we recommend that details regarding proposed modifications to the project, including the draft NEPA document, be made available to affected EJ communities for their review and comment. These outreach efforts would provide the affected communities with a clearer picture of the potential impacts of the project and assist the Corps in their decision-making process.

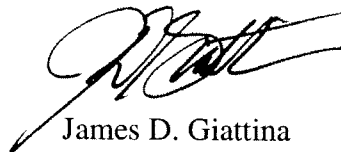
## **Conclusion**

Modifications consistent with EPA's recommendations are needed to ensure that the CWA Section 404 permit would be consistent with the Section 404(b)(1) Guidelines. Absent modification, discharges associated with the proposed project have not been effectively avoided and minimized, would cause or contribute to violation of applicable water quality standards, would cause or contribute to significant degradation of the aquatic environment, and may not be adequately mitigated. Depending on the results of the reassessment of predicted impacts, additional compensatory mitigation may be required to compensate for lost stream functions. As described above, we have enclosed recommended special permit and monitoring conditions we believe are necessary to ensure compliance with the Section 404(b)(1) Guidelines. The absence of these improvements would render this permit a candidate for further review under CWA Section 404(c) given the nature and extent of anticipated unacceptable adverse impacts. In addition, we do not believe that the Corps can support a Finding of No Significant Impact under the National Environmental Policy Act without adopting these recommended special permit conditions, in which case we would recommend that the Corps prepare an Environmental Impact Statement.

---

I want to thank you and your staff for your cooperation and willingness to address our issues. We appreciate being able to work closely with you and the applicant to resolve the concerns outlined above, and hope to be able to continue to do so as necessary. If you have any questions, please call me at (404) 562-9470 or Kevin H. Miller of my staff at (404) 562-9435.

Sincerely,



James D. Giattina  
Director  
Water Protection Division

Enclosure 1: Recommended Special Permit and Monitoring Conditions  
Enclosure 2: Adaptive Management Plan Timelines

cc: Jim Townsend, Louisville District, Louisville, KY  
Lee Anne Devine, Louisville District, Louisville, KY  
Todd Williams, Louisville District, Sassafras, KY  
Joe Blackburn, Office of Surface Mining, Lexington, KY  
Lee Andrews, U.S. Fish and Wildlife Service, Frankfort, KY  
Carrie Lona, U.S. Fish and Wildlife Service, Frankfort, KY  
Carl Campbell, Kentucky Department of Natural Resources, Frankfort, KY  
Bruce Scott, Kentucky Department of Environmental Protection, Frankfort, KY  
Sandy Gruzesky, Kentucky Division of Water, Frankfort, KY

To:

Jim Townsend: james.m.townsend@usace.army.mil  
Lee Anne Devine: lee.anne.devine@usace.army.mil  
Todd Williams: Christopher.T.Williams@usace.army.mil  
Joe Blackburn: jblackburn@osmre.gov  
Carrie Lona: carrie\_lona@fws.gov  
Lee Andrews: lee.andrews@fws.gov  
Carl Campbell: carl.campbell@ky.gov  
Bruce Scott: bruce.scott@ky.gov  
Sandy Gruzesky: sandy.gruzesky@ky.gov

---

## **Enclosure 1**

### **Recommended Special Permit and Monitoring Conditions**

#### **I. Recommended Special Permit Conditions**

- A. The permittee shall adhere to the plans and conditions included in the permit application submitted on a CD dated March 3, 2010 and all subsequently obtained supplemental information.
- B. The permittee shall submit a detailed plan to the U.S. Army Corps of Engineers Louisville District (Corps) and the U.S. Environmental Protection Agency, Region 4 (EPA) for implementing mine design and hollow fill construction alternatives and best management practices (BMPs) to minimize total dissolved solids (TDS) and specific conductance (SC, or conductivity) during the placement of fill material into waters of the United States (U.S.) during mining, reclamation and the construction of the hollow fills. The objective of these procedures is to ensure that mine effluent cannot reasonably be expected to cause or contribute to excursions from narrative water quality criteria and/or significant degradation, consistent with best-available science on the association between conductivity and adverse impacts to aquatic ecosystems (noted above under Footnote 1), as measured by monthly flow-weighted conductivity (see Special Permit Conditions I.E. and I.F., below). This plan must be approved by the Corps, and transmitted to EPA, prior to discharge of any dredged or fill material into any water of the U.S. Proposed actions should include, but are not necessarily limited to<sup>3</sup>:

#### General BMPs

- Existing vegetation will be retained to the extent practicable.
- Highly reactive strata units (TDS and/or sulfate producing geologic strata<sup>4</sup>) will be identified and isolated as part of the mining process.
- Acidic and toxic material encountered during the mining operation will be handled in accordance with the approved Toxic Materials Handling Plan in the project's SMCRA permit.
- Topsoil or topsoil substitute, as approved by the Kentucky Department for Natural Resources (KDNR) in the SMCRA permit for this project will be stockpiled and managed so that re-graded areas can be covered with a layer of topsoil or topsoil substitute and revegetated as quickly as practicable.

#### Hollow Fill Construction/Reclamation BMPs

- Implement hollow fill design alternatives that reduce infiltration (e.g. compact surface lifts, crown the fill surface) and controls flow through the fill to avoid contact time between water and highly reactive materials (i.e. TDS and/or sulfate producing geologic strata<sup>4</sup>).
- The fill will be constructed in a "bottom-up" manner with 50 foot vertical lifts.

---

<sup>3</sup> The listed BMPs were proposed by the applicant in supplemental materials received by EPA on November 4 and November 24, 2010.

<sup>4</sup> Although not specifically proposed by the permittee, "highly reactive materials" may be defined by Potential Acidity and any appropriate field or lab test agreeable to the permittee, the Corps and the EPA.

- Low-reactive durable rock wrapped in filter fabric to prevent clogging will be used for construction of the underdrain. Identification of low-reactive rock will be based on low Potential Acidity values<sup>5</sup>.
- Diversions will be constructed around the fills so that surface runoff from upland areas will be intercepted and not infiltrate the fill. Diversion channels will be constructed to pass flows as dictated by the SMCRA regulations.
- The material placed at the top of the fill will be compacted as it is place to form an earthen cap reducing the void space between the particles and the associated potential for infiltration of water.
- The fills will be vegetated during construction after being brought to final grade to reduce erosion of the material.

#### Sediment Control BMPs

- Temporary sediment control structures such as silt fence, straw bales, rock checks, dikes, and/or channel barriers will be used, as necessary, to prevent the transport of sediment downstream.
- Sediment and erosion control measures will be inspected by a qualified individual appointed by the applicant's management at least twice per month and after every rainfall exceeding 0.5 inches in a 24 hour period (as measured at the project site) to ensure the structure and measures are functioning properly and to identify any required maintenance.
- Chemical treatment of the ponds will be used, if necessary and practicable to facilitate compliance with the projects KPDES permit.

In addition to the BMPs listed above, proposed by the applicant in supplemental information received by EPA on November 4 and November 24, 2010, EPA recommends that other BMPs should be implemented immediately in order to reduce the likelihood that water quality problems will occur. Such BMPs could include:

- taking further steps to minimize water infiltration into fill material using synthetic caps or liners;
- promoting diffuse discharges to mimic forested watersheds using techniques such as weep berm-forest passive treatment systems; and
- utilizing the Forest Reclamation Approach (FRA).

EPA recognizes that most, if not all, of these BMPs would be considered experimental practices under KDNR SMCRA regulations. EPA would strongly support efforts by the applicant to obtain authorization as needed from the KDNR and the Office of Surface Mining Reclamation and Enforcement to use these techniques.

- C. The permittee shall submit documentation to the Corps and EPA indicating all BMPs employed to minimize TDS and SC during the placement of fill material into waters of the United States and before and during mining and reclamation activities, including the construction of the backstacks and valley fills. The initial documentation must be submitted within 30 days of site preparation and commencement of construction of the rock underdrain. After this initial submittal, the permittee shall submit documentation

---

<sup>5</sup> Although not specifically proposed by the permittee, "low-reactive durable rock" may also be defined as the most weathered upper strata and by any appropriate field or lab test agreeable to the permittee, the Corps and the EPA.

every 6 months unless the AMP has been triggered through Special Condition I.E or I.F., below. All monitoring data and analyses (effluent monitoring, in-stream chemical and biological monitoring, mitigation monitoring, and AMP trigger analysis) shall be reported to the Corps and EPA within 30 days of being collected.

- D. Prior to beginning discharge of materials into waters of the United States, the permittee shall reassess the need for excess spoil storage in valley fills, based on changes in fill construction described in Special Permit Condition I.B., above, to determine whether it is possible to avoid at least one fill, and submit documentation of that assessment to the Corps and EPA.

Before any material is discharged into waters of the United States for each subsequent pair of valley fills (see Special Permit Condition I.G., below), the applicant shall reassess the need for additional excess spoil storage in valley fills through an appropriate engineering analysis that includes comparison of actual mined coal tonnage, spoil generation rates, and the amount of spoil stored in valley fills with those permitted.

If the applicant (permittee) is successful in optimizing fill placement such that one or more valley fills is not necessary, or if the Corps or EPA determines that the permittee's analysis is insufficient or not compelling, the permittee shall protect any unfilled valleys by a permanent conservation easement to ensure that the stream continues to provide clean dilution water to the watershed.

- E. The permittee shall monitor the effluent of each sediment pond for conductivity two times per month and submit monthly flow-weighted conductivity,  $\bar{K}$ , following the commencement of discharges of material into waters of the United States to the Corps and EPA. The applicant must submit these data monthly to the agencies described below and must begin data collection and submittal immediately upon permit issuance and continue until final bond release. Monthly flow-weighted conductivity shall be calculated as follows:

$$\bar{K} = \frac{\sum_i (Q_i \times K_i)}{\sum_i Q_i}$$

where:

$\bar{K}$  = monthly flow-weighted conductivity,  $\mu\text{S}/\text{cm}$

$Q_i$  = flow for the  $i^{\text{th}}$  sample, cfs

$K_i$  = conductivity for the  $i^{\text{th}}$  sample,  $\mu\text{S}/\text{cm}$ .

The monthly flow-weighted conductivity,  $\bar{K}$ , will be plotted as a time series and the trend in effluent conductivity calculated by linear regression, based on the most recent six month's data, beginning after completion of Initial Fill Construction<sup>6</sup>. The trend shall be

<sup>6</sup> "Initial Fill Construction" is defined as "the stage of the hollow fill construction at which overburden material is placed in the hollow fill to the elevation of the base mining coal seam in that area" (Supplemental Material received November 4, 2010). It is noted that according to the MRP, this elevation is at or about 1,390 feet, the elevation of the Hazard 5a seam.



calculated based on three month's data after completion of Initial Fill Construction until more data are available. If the trend indicates that any pond's monthly flow-weighted conductivity will exceed 500  $\mu\text{S}/\text{cm}$  within the next three months, or if any two consecutive monthly flow-weighted conductivity values for any pond exceeds 500  $\mu\text{S}/\text{cm}$ , then the permittee will conduct an analysis of the sources of effluent conductivity and develop a Phase I Adaptive Management Plan (AMP) to reduce effluent conductivity (or specific conductance, SC, and total dissolved solids, TDS). Examples of design alternatives, best management practices (BMP), and treatment technologies to include in the Phase I Adaptive Management Plan may include, but are not limited to:

- The use of flocculents designed specifically to reduce total suspended solids/TDS/SC (with appropriate approval from the Kentucky Division of Water, KDOW); and
- Floating siphons to decant the cleanest water prior to discharge to receiving streams.

The conductivity trend analysis and Phase I Adaptive Management Plan shall be submitted to the Corps and EPA for approval within 30 days of determining that the trend will exceed 500  $\mu\text{S}/\text{cm}$  within the next three months for any pond, or within 30 days of determining that two consecutive monthly flow-weighted conductivity values for any pond have exceeded 500  $\mu\text{S}/\text{cm}$ . The plan shall be implemented within 45 days of written approval by the Corps and EPA. Implementation of the Phase I AMP will continue until three consecutive monthly flow-weighted conductivity values are below 500  $\mu\text{S}/\text{cm}$  for all ponds, and until the trend does not indicate that monthly flow-weighted conductivity will again exceed 500  $\mu\text{S}/\text{cm}$ .

If either the calculated trend or the actual data indicate that monthly flow-weighted conductivity values for any pond will exceed or have exceeded 500  $\mu\text{S}/\text{cm}$  continually for six months after implementation of the Phase I AMP, the permittee will retain, within 30 days, a consultant mutually agreed upon by the permittee, the Corps and EPA. The consultant shall prepare within 90 days recommendations for additional actions to reduce effluent conductivity (a Phase II AMP). These recommendations shall be implemented within 45 day of written approval by the Corps and EPA. This requirement will reiterate every six months after implementation of the approved additional actions as long as the trend or monthly flow-weighted conductivity values exceed 500  $\mu\text{S}/\text{cm}$ .

F. Background monitoring (in-stream).

The permittee shall monitor in-stream conductivity two times per month in Stacy Branch, Sugar Creek, and Yellow Creek to establish a baseline conductivity level against which future project impacts will be evaluated. The applicant must submit these data monthly to the agencies described under Special Permit Condition I.E, above, and must begin data collection and submittal immediately upon permit issuance and continue until final bond release. The baseline conductivity level will be calculated from these data using a method mutually agreeable to the Corps and EPA.

For each stream, monthly average conductivity will be plotted as a time series and the trend in effluent conductivity calculated by linear regression, based on the most recent six month's data. If any two consecutive monthly average conductivity values for any stream exceed 500  $\mu\text{S}/\text{cm}$  or baseline conductivity level, whichever is greater, or if the trend indicates that any stream's monthly average conductivity will exceed 500  $\mu\text{S}/\text{cm}$  or baseline conductivity level, whichever is greater, within the next three months, then the permittee will conduct an analysis of the causes of elevated in-stream conductivity, including any other discharges in the watershed (such as from underground mines), and develop a Phase I Adaptive Management Plan for Streams (AMP) to reduce in-stream conductivity, similar to that described under Special Permit Condition I.E., above.

The conductivity trend analysis and Phase I Adaptive Management Plan for Streams shall be submitted to the Corps and EPA for approval within 30 days of determining that two consecutive monthly average conductivity values for any stream have exceeded 500  $\mu\text{S}/\text{cm}$  or baseline conductivity level, whichever is greater, or within 30 days of determining that the trend will exceed 500  $\mu\text{S}/\text{cm}$  or baseline conductivity level, whichever is greater, within the next three months for any stream. The plan shall be implemented within 45 days of written approval by the Corps and EPA. Implementation of the Phase I AMP for Streams will continue until three consecutive monthly average conductivity values are below 500  $\mu\text{S}/\text{cm}$  for all streams, and until the trend does not indicate that monthly average conductivity will again exceed 500  $\mu\text{S}/\text{cm}$ .

If either the calculated trend or the actual data indicate that monthly average conductivity values for any stream will exceed or have exceeded 500  $\mu\text{S}/\text{cm}$  or baseline conductivity level, whichever is greater, continually for six months after implementation of the Phase I AMP for streams, the permittee will retain, within 30 days, a consultant mutually agreed upon by the permittee, the Corps and EPA. The consultant shall prepare within 90 days recommendations for additional actions to reduce in-stream conductivity and/or to reduce conductivity from or eliminate any discharges in the watershed(s) (a Phase II AMP for Streams). These recommendations shall be implemented within 45 day of written approval by the Corps and EPA. This requirement will reiterate every six months after implementation of the approved additional actions as long as the trend or monthly average stream conductivity values exceed 500  $\mu\text{S}/\text{cm}$  or baseline conductivity level, whichever is greater.

G. Sequenced Fill Construction.

- 1) You are authorized to proceed with the construction of two valley fills: one of the larger fills (3, 4 or 6) and one of the smaller fills (2, 5 and 7) and their associated Sediment Ponds. You are further authorized to proceed with the construction of two more valley fills, one of the remaining larger fills and one of the remaining smaller fills, and their associated Sediment Ponds if and only if:
  - a) the monthly flow-weighted pond effluent conductivity values shall not exceed 500  $\mu\text{S}/\text{cm}$  for any pond for two or more months consecutively since completion of Initial Fill Construction; and

- b) the trend in pond effluent conductivity calculated as described above (based on the most recent six month's data collected after completion of Initial Fill Construction) indicates that monthly flow-weighted conductivity will not exceed 500  $\mu\text{S}/\text{cm}$  for all ponds; and
  - c) the monthly average in-stream conductivity values shall not exceed 500  $\mu\text{S}/\text{cm}$  or baseline conductivity level (as defined under Special Permit Condition I.F., above), whichever is higher, for any stream for two or more months consecutively for any stream; and
  - d) the trend in stream conductivity calculated as described above (based on the most recent six month's data) indicates that monthly average conductivity will not exceed 500  $\mu\text{S}/\text{cm}$  or baseline conductivity level (as defined under Special Permit Condition I.F., above), whichever is higher, for all streams.
- H. Prior to any site disturbance the permittee shall reevaluate stream conditions on site using the Eastern Kentucky Stream Assessment Protocol and provide full documentation to the Corps and EPA. Based on the site evaluation, the applicant shall also provide the agencies with an updated Compensatory Mitigation Plan (CMP). Upon written approval of the agencies the applicant can proceed with discharges to waters of the United States in accordance with this permit and the approved CMP.

## **II. Effluent and In-stream Chemical and Biological Monitoring**

### **A. Effluent Monitoring**

#### **1. Parameters and Test Methods**

- a) Hydrologic permanence of outflow from the ponds should be monitored and recorded by a continuously recording measurement device.
- b) The permittee should perform effluent monitoring of the parameters listed in Table 1, analyzed using EPA Test Methods in 40 CFR Part 136 by an licensed laboratory.<sup>7</sup>
- c) When conducting effluent monitoring, the permittee must follow the appropriate and approved Kentucky Division of Water (KDOW) protocols, standard operating procedures, and quality assurance requirements as specified in the "Quality Assurance Project Plan (QAPP) for Individual Coal Mining Permits: Focus Monitoring for Water Quality, Biological Communities and Habitat Conditions."

---

<sup>7</sup> Where EPA has approved more than one analytical method for a pollutant, the Agency expects that applicants and permittees would select methods that are able to quantify the presence of pollutants in a given discharge at concentrations that are low enough to determine compliance with Water Quality Criteria. Permit applicants should not use a less sensitive or less appropriate method, thus masking the presence of a pollutant in the discharge, when an EPA-approved method is available that can quantify the pollutant concentration at the lower levels needed for permit decision making. For purposes of permit applications and compliance monitoring, a method is "sufficiently sensitive" when (1) the method's quantitation level is at or below the level of the applicable water quality criterion for the pollutant or (2) the method's quantitation level is above the applicable water quality criterion, but the amount of pollutant in a facility's discharge is high enough that the method detects and quantifies the level of pollutant in the discharge.

The QAPP shall be submitted to the Corps, USEPA R4 and KDOW within 30 days of permit issuance. The Corps will coordinate approval of the QAPP with the agencies. The effluent monitoring may be included as part of the QAPP that has been or will be developed for the KPDES required monitoring, or it may be included in a separate QAPP. Receiving KDOW approval is not a requirement of the effluent monitoring Special Condition. The protocols are available on KDOW's website at: <http://water.ky.gov/permitting/Pages/Mining.aspx>

## 2. Sample Type

Grab samples shall be taken. Grab sample is defined as an individual sample of at least 100 milliliters collected at a randomly selected time over a period not exceeding fifteen minutes.

## 3. Sampling Frequency

The sampling frequency is as noted in Table 1. Effluent monitoring shall continue through final bond release. Samples that are required quarterly should be collected at least five (5) days apart, and the amount of precipitation for the previous 24 hour period should be recorded on-site and reported (to the nearest 0.1 inch) as part of the sampling report.

In the event that in-stream monitoring results show in-stream specific conductivity levels above 500  $\mu\text{S}/\text{cm}$ , the permittee is required to increase the effluent monitoring frequency for all parameters to two times per month. Samples that are required twice per month should be collected at least five (5) days apart, and the amount of precipitation for the previous 48 hour period should be recorded on-site and reported (to the nearest 0.1 inch) as part of the sampling report.

## 4. Sampling Locations

The permittee should perform effluent monitoring from at least one outfall (i.e., a "representative outfall") in each receiving water body, to be specified in the NPDES permit by KDOW. Selected outfalls for each receiving water body should be representative of the effluent being discharged from the mine site and expected by KDOW to have the greatest impact on downstream water quality (e.g., the mine site area which is currently undergoing the most mining disturbance, or the outfall with the largest discharge) based on the information submitted in the permit application.

## 5. Reporting

Reports shall contain tabulated data (including sample station identification, date, and time) and graphs necessary to present information clearly and concisely, including all such tables and graphs necessary to summarize and present the entire period of record for each parameter and sample station. Latitude and longitude coordinates of all water quality monitoring locations with the applicable datum identified must be provided along with photographs and figures illustrating all sample locations. Calibration records of all *in-situ* multi-probe or single-probe water quality instruments and laboratory reports showing the analytical results must also be submitted.

All results should be clearly labeled with the applicable CWA permit number and KDNR DMP number and submitted to KDOW, the Corps, and EPA Region 4.

Results should be sent to EPA at: EPA Region 4 Water Protection Division  
Wetlands, Coastal & Oceans Branch, Mining Section  
61 Forsyth Street SW  
Atlanta, GA 30303-8960

Table 1 - Supplemental effluent and in-stream water quality monitoring parameters.

Parameter	Units	Method	Sample Frequency <sup>1</sup>
Bicarbonate Alkalinity	mg/l		Quarterly
Chlorides	mg/l	EPA 300.0	Quarterly
Discharge	Cfs	DOWSOP03019*	Quarterly
Dissolved oxygen	mg/l	DOWSOP03014*	Quarterly
Duration of discharge <sup>2</sup>	days		Continuous
Hardness (as CaCO <sub>3</sub> )	mg/l	SM 2340B	Quarterly
pH	s.u.	DOWSOP03014*	Quarterly
Precipitation	inches		Continuous
Sulfates	mg/l	EPA 300.0	Quarterly
Specific conductance	µS/cm	EPA 120.1	Quarterly
Temperature	Deg C	DOWSOP03014*	Quarterly
Turbidity	Ntu	DOWSOP03014*	Quarterly
Total Dissolved Solids (TDS)	mg/l	SM 2540C	Quarterly
Total Calcium	µg/l	EPA 200.7	Quarterly
Total Magnesium	µg/l	EPA 200.7	Quarterly
Total Potassium	µg/l		Quarterly
Total Sodium	µg/l		Quarterly
Total Recoverable Antimony	µg/l	EPA 200.8	Quarterly
Total Recoverable Arsenic	µg/l	EPA 200.8	Quarterly
Total Recoverable Beryllium	µg/l	EPA 200.8	Quarterly
Total Recoverable Cadmium	µg/l	EPA 200.8	Quarterly
Total Recoverable Chromium (III)	µg/l		Quarterly
Total Recoverable Chromium (IV)	µg/l		Quarterly
Total Recoverable Copper	µg/l	EPA 200.8	Quarterly
Total Recoverable Iron	µg/l	EPA 200.8	Quarterly
Total Recoverable Lead	µg/l	EPA 200.8	Quarterly
Total Recoverable Manganese	µg/l	EPA 200.8	Quarterly
Total Recoverable Mercury	µg/l	EPA 1631E or 245.7	Quarterly
Total Recoverable Nickel	µg/l	EPA 200.8	Quarterly
Total Recoverable Selenium	µg/l	EPA 200.8	Quarterly
Total Recoverable Silver	µg/l	EPA 200.8	Quarterly
Total Recoverable Thallium	µg/l	EPA 200.8	Quarterly
Total Recoverable Zinc	µg/l	EPA 200.8	Quarterly

<sup>1</sup> The sample frequency increases to twice per month should the in-stream specific conductivity exceed 500 µS/cm.

<sup>2</sup> Duration of discharge from pond should be measured using a continuously recording data logger.

\* KDOW, 2009. *In situ* Water Quality Measurements and Meter Calibration Standard Operating Procedure. Kentucky Department for Environmental Protection, Division of Water, Frankfort, Kentucky.

## B. Whole Effluent Toxicity (WET) Monitoring

Depending on the duration of the discharge, coal mining permits should require the permittee to perform acute and/or chronic WET tests on the representative outfalls (as specified above under "Effluent Monitoring") for all coal mining discharges. WET monitoring shall be

conducted quarterly. All results should be clearly labeled with the applicable CWA permit number and KDNR DMP number and submitted to KDOW, the Corps, and EPA Region 4.

In cases where monitoring data indicate a sedimentation pond with any volume of discharge lasting more than 4 consecutive days, chronic WET tests should be performed using *Ceriodaphnia dubia* and *Pimephales promelas* and using a dilution series that includes 100% effluent and the in-stream waste concentration. The end points should be reported as the inhibition concentration that affects 25% of the test organisms compared to the control (IC<sub>25</sub>). Sampling should be performed quarterly. The operator should use WET testing procedures outlined in EPA's document entitled, "Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms" (October 2002).

In cases where the effluent discharge may be short in duration, it may be necessary to collect a high volume effluent sample and properly preserve it for use in the static-renewal test. Please refer to Section 8.5.4 on page 32 of EPA's document entitled, "Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms" (October 2002). Alternative acute WET test organisms are either *Daphnia magna* or *D. pulex* and *Pimaphales promelas*.

When conducting WET testing, the permittee must follow the appropriate and approved KDOW protocols, standard operating procedures, and quality assurance requirements as specified in the "Quality Assurance Project Plan (QAPP) for Individual Coal Mining Permits: Focus Monitoring for Water Quality, Biological Communities and Habitat Conditions." The QAPP shall be submitted to the Corps, USEPA R4 and KDOW within 30 days of permit issuance. The Corps will coordinate approval of the QAPP with the agencies. WET testing may be included as part of the QAPP that has been or will be developed for the KPDES required monitoring, or it may be included in a separate QAPP. Receiving KDOW approval is not a requirement of WET monitoring Special Condition. The protocols are available on KDOW's website at: <http://water.ky.gov/permitting/Pages/Mining.aspx>

## **C. In-stream Chemical Monitoring**

### **1. Parameters and Test Methods**

The permittee should perform in-stream chemical monitoring of the parameters listed in Table 1, and analyzed using EPA Test Methods in 40 CFR Part 136 by an approved licensed laboratory.<sup>1</sup>

When conducting in-stream chemical monitoring, the permittee must follow the appropriate and approved KDOW protocols, standard operating procedures, and quality assurance requirements as specified in the QAPP. The QAPP shall be submitted to the Corps, USEPA R4 and KDOW within 30 days of permit issuance. The Corps will coordinate approval of the QAPP with the agencies. The in-stream chemical monitoring may be included as part of the QAPP that has been or will be developed for the KPDES required monitoring, or it may be included in a separate QAPP. Receiving KDOW approval is not a requirement of the in-stream chemical monitoring Special Condition. The protocols are available on KDOW's website at: <http://water.ky.gov/permitting/Pages/Mining.aspx>

## 2. Sample Type

Grab samples shall be taken. Grab sample is defined as an individual sample of at least 100 milliliters collected at a randomly selected time over a period not exceeding fifteen minutes.

## 3. Sample Frequency

The sampling frequency is as noted in Table 1. In-stream chemical monitoring shall continue through final bond release. Samples that are required quarterly should be collected at least five (5) days apart, and the amount of precipitation for the previous 24 hour period should be recorded on-site and reported (to the nearest 0.1 inch) as part of the sampling report.

In the event that in-stream monitoring results show in-stream specific conductivity levels above 500  $\mu\text{S}/\text{cm}$ , the permittee is required to increase the in-stream chemical monitoring frequency for all parameters to two times per month. Samples that are required twice per month should be collected at least five (5) days apart, and the amount of precipitation for the previous 48 hour period should be recorded on-site and reported (to the nearest 0.1 inch) as part of the sampling report.

## 4. Sampling Locations

Samples should be taken from the following locations:

- a. One sampling point located upstream of the sediment pond for each representative outfall, as specified above under "Effluent Monitoring." If there is no upstream location, an appropriate background location within the 12-digit hydrologic unit code should be used.
- b. One in-stream monitoring site located immediately below the toe of the sediment pond for each representative outfall, as specified above under "Effluent Monitoring."
- c. One sampling point located *the further of 200 meters (656 feet) downstream of for* each representative outfall, as specified above under "Effluent Monitoring," or the furthest downstream location that is upstream of any intervening tributaries. The sampling point should be downstream of riprap and other disturbance and located within a relatively natural and intact riparian zone.
- d. One sampling point located downstream of the first intervening tributary.

## 5. Reporting

Reports shall contain tabulated data (including sample station identification, date, and time) and graphs necessary to present information clearly and concisely, including all such tables and graphs necessary to summarize and present the entire period of record for each parameter and sample station. Latitude and longitude coordinates of all water quality monitoring locations with the applicable datum identified must be provided along with photographs and figures illustrating all sample locations. Calibration records of all *in-situ* multi-probe or single-probe water quality instruments and laboratory reports showing the analytical results must also be submitted.

All results should be clearly labeled with the applicable CWA permit number and KDNR DMP number and submitted to KDOW, the Corps, and EPA Region 4.

## **D. In-stream Biological Monitoring**

The permittee should implement an annual biological assessment during critical low-flow conditions using approved state protocols.

### **1. Concurrent in-stream monitoring**

In-stream samples for SC, TDS, pH, temperature, and dissolved oxygen should be taken at the same locations as the benthic samples.

### **2. Methods**

Sampling should be avoided during periods of excessive precipitation and scouring floods. In cases where a large flow rate of the receiving water does not lend itself to a benthic assessment (i.e., only has non-wadeable streams), the permittee should perform a bioassessment using fish. Both fish and benthic macroinvertebrate studies should be performed for receiving water bodies that are conducive to fish assessments. Results from sampling either of the two assemblages may be used to determine if the water body is impaired.

When conducting in-stream biological monitoring, the permittee must follow the appropriate and approved KDOW protocols, standard operating procedures, and quality assurance requirements as specified in the QAPP. The QAPP shall be submitted to the Corps, USEPA R4 and KDOW within 30 days of permit issuance. The Corps will coordinate approval of the QAPP with the agencies. The in-stream biological monitoring may be included as part of the QAPP that has been or will be developed for the KPDES required monitoring, or it may be included in a separate QAPP. Receiving KDOW approval is not a requirement of the in-stream biological monitoring Special Condition. The protocols are available on KDOW's website at: <http://water.ky.gov/permitting/Pages/Mining.aspx>

### **3. Sampling Frequency**

Sampling times will occur consistent with accepted Kentucky protocols (i.e. sample index periods). Sampling will occur annually through final bond release. Sampling should be avoided during periods of excessive precipitation and scouring floods. In cases where a large flow rate of the receiving water does not lend itself to a benthic assessment (i.e., non-wadeable streams), the permittee should perform a bioassessment using fish. Both fish and benthic macroinvertebrate studies should be performed for receiving water bodies that are conducive to fish assessments. Results from sampling either of the two assemblages may be used to determine if the water body is impaired.

### **4. Sampling Locations**

Use the same locations as shown above for in-stream chemical monitoring.

### **5. Reporting**

Reports shall contain tabulated data (including sample station I.D., date, and time) and graphs necessary to present information clearly and concisely, including all tables, indices of biotic integrity, and graphs necessary to summarize and present the entire period of record for each parameter and sample station. Latitude and longitude coordinates of all water quality monitoring locations with the applicable datum identified must be provided along with photographs and figures illustrating all sample locations. Calibration records of all *in-situ*



multi-probe or single-probe water quality instruments and laboratory reports showing the analytical results must also be submitted.

All results should be clearly labeled with the applicable CWA permit number and KDNR DMP number and submitted to KDOW, the Corps, and EPA Region 4.

## Enclosure 2

### Adaptive Management Plan Implementation Timeline—Pond Effluent

Phase	Action	Time allowed	Estimated time since initial discharge of fill material into waters of the U.S. <sup>8</sup>
Pre-AMP	Initial Fill Construction <sup>9</sup>	Not specified in Special Condition; estimate 3 months	Not specified in Special Condition; estimate 3 months
	Monitoring after Initial Fill Construction	2 months minimum <sup>10</sup>	5 months
AMP Phase I (if applicable)	Submit AMP I	30 days after AMP I trigger	6 months
	Approve AMP I	Not specified in Special Condition; estimate 45 days	7.5 months
	Implement AMP I	45 days after AMP I Approval	9 months
	Monitor AMP I	6 months minimum	15 months
AMP Phase II (if applicable)	Retain consultant	30 days after AMP II trigger	16 months
	Develop and submit AMP II	90 days after AMP II trigger	19 months
	Approve AMP II	Not specified in Special Condition, estimate 45 days	20.5 months
	Implement AMP II	45 days after AMP II approval	22 months
	Monitor AMP II	6 months minimum	28 months
Additional Iterations (if applicable)	Develop and submit AMP	90 days after AMP trigger	31 months
	Approve AMP	Not specified in Special Condition, estimate 45 days	32.5 months
	Implement AMP	45 days after AMP approval	34 months
	Monitor AMP	6 months minimum	40 months

<sup>8</sup> Estimates assume minimum times allowed.

<sup>9</sup> "Initial Fill Construction" is defined as "the stage of the hollow fill construction at which overburden material is placed in the hollow fill to the elevation of the base mining coal seam in that area" (Supplemental Material received November 4, 2010). It is noted that according to the MRP, this elevation is at or about 1,390 feet, the elevation of the Hazard 5a seam. Note that monitoring data shall be collected and submitted immediately upon permit issuance and until final bond release.

<sup>10</sup> Monitoring in any Phase will continue until the next Phase is triggered or permit expiration, whichever occurs first.

### Adaptive Management Plan Implementation Timeline—In-stream

Phase	Action	Time allowed	Estimated time since permit issuance <sup>11</sup>
Pre-AMP	Background monitoring	2 months minimum <sup>12</sup>	2 months
AMP Phase I (if applicable)	Submit AMP I	30 days after AMP I trigger	3 months
	Approve AMP I	Not specified in Special Condition; estimate 45 days	4.5 months
	Implement AMP I	45 days after AMP I Approval	6 months
	Monitor AMP I	6 months minimum	12 months
AMP Phase II (if applicable)	Retain consultant	30 days after AMP II trigger	13 months
	Develop and submit AMP II	90 days after AMP II trigger	16 months
	Approve AMP II	Not specified in Special Condition, estimate 45 days	17.5 months
	Implement AMP II	45 days after AMP II approval	19 months
	Monitor AMP II	6 months minimum	25 months
Additional Iterations (if applicable)	Develop and submit AMP	90 days after AMP trigger	28 months
	Approve AMP	Not specified in Special Condition, estimate 45 days	29.5 months
	Implement AMP	45 days after AMP approval	31 months
	Monitor AMP	6 months minimum	3 months

<sup>11</sup> Estimates assume minimum times allowed.

<sup>12</sup> Monitoring in any Phase will continue until the next Phase is triggered or permit expiration, whichever occurs first.